

SOCIOMETRIC CORRELATES OF LOCUS OF CONTROL IN
EARLY ADOLESCENCE

By

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A DISSERTATION PRESENTED TO THE GRADUATE COUNCIL OF
THE UNIVERSITY OF FLORIDA
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
DEGREE OF DOCTOR OF PHILOSOPHY

UNIVERSITY OF FLORIDA

June 1977

ACKNOWLEDGMENTS

I would like to thank my chairman, Dr. Patricia Ashton. I needed and appreciated her patient, thorough guidance. She helped me to be more exact.

I would also like to thank the other members of my committee, Dr. Mary Budd Rowe, Dr. Robert C. Ziller, and Dr. Walter A. Busby. Dr. Rowe has helped to sharpen my thinking through her challenging questions, Dr. Ziller has encouraged my creativity, and Dr. Busby has expanded my viewpoint, showing me things that I have never been aware of. I would also like to thank William Purkey for getting me started on this project.

I am indebted to the students and teachers of Palatka Middle School for participating in this project. I would also like to thank my parents, Mathew and Rita, for giving me the confidence needed to undertake and complete this project.

I would like to give special thanks to my wife, Patricia. She worked very hard to give me the freedom to complete this study. Without her love and support it would have never been possible.

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Abstract of Thesis Presented to the Council
of the University of Florida in Partial Fulfillment of the
Requirements for the Degree of Doctor of Philosophy

Sociometric Correlates of Locus of Control in
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By

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June, 1977

Chairman: Patricia T. Ashton
Major Department: Foundations of Education

This study investigated the relationship between adolescents' locus of control and their peer preferences. Locus of control was defined as the degree to which an individual expects that his reinforcement is contingent upon his behavior; individuals with an internal locus of control generally believe that they control what happens to them, whereas those with an external locus of control believe that their destiny is beyond their control and is determined by fate, luck or powerful others.

There has been a great deal of research indicating that internality is associated with academic success and cognitive superiority, but there has been relatively little investigation of the social correlates of locus of control. This study related

locus of control to popularity as a friend, popularity as a working partner, and interpersonal attraction. More specifically, the following hypotheses were tested:

1. Internal adolescents are more popular (have more friends) than their external peers.
2. Internals are more popular as working partners on an academic project than they are as friends.
3. Adolescents tend to choose as friends those who are similar to themselves in locus of control.

To investigate these hypotheses, 200 eighth graders were administered the Nowicki-Strickland Locus of Control Scale for Children and two sociometric items. The first sociometric item was "Name the students who are your best friends," and the second item was "If you had to work on a group project in English with three other students who would you select to work with?"

Multiple regression was used to analyze each hypothesis. For the first hypothesis, the dependent variable was sociometric status on the best friends item (SMS_{bf}); that is, the number of times the subject was chosen as a best friend. The principal independent variable was the subject's locus of control (LOC); thus, locus of control was used to predict popularity. Sex and race were controlled by forcing these two variables into the multiple regression equation before locus of control. Also,

interaction between locus of control and sex (LOC x sex) and locus of control and race (LOC x race) and curvilinear locus of control term (LOC²) were checked for significance. Thus, the complete multiple regression equation was as follows:

$$\hat{SMS}_{bf} = \text{sex} + \text{race} + \text{LOC} + (\text{LOC} \times \text{sex}) + (\text{LOC} \times \text{race}) + \text{LOC}^2$$

The predictors for the other two hypotheses were the same as above; the dependent variable for the second hypothesis was sociometric status on the work-project item; and for the third hypothesis, it was the subjects' friends' locus of control. Thus, the subjects' locus of control was used to predict their social popularity, popularity as a working partner, and their friends' locus of control.

In each of these multiple regression equations, with sex and race partialled out, locus of control was a statistically significant ($p < .01$) predictor of the dependent variable. However, locus of control, with sex and race partialled out, accounted for less than three percent of the variance in social popularity and less than two percent of the variance in friends' locus of control. Locus of control accounted for about eight percent of the variance in sociometric status on the work-project item.

The data indicate that (1) the internal subjects were slightly more popular, as friends, than the externals; (2) the internals were considerably more popular as working partners; and (3) the

subjects, especially the internals, had a tendency to choose friends of a similar locus of control, but most of this tendency was due to racial and sexual preferences and racial and sexual differences in locus of control.

CHAPTER I INTRODUCTION

Background and Purpose

Locus of control is a personality variable that has generated a great deal of research in the past ten years (Phares, 1976). Rotter (1966) developed the concept of locus of control and described it as follows:

When a reinforcement is perceived by the subject as following some action of his own but not being entirely contingent upon his action, then, in our culture, it is typically perceived as the result of luck, chance, fate, as under the control of powerful others, or as unpredictable because of the great complexity of the forces surrounding him. When the event is interpreted in this way by an individual, we have labeled this a belief in external control. If the person perceives that the event is contingent upon his behavior or his own relatively permanent characteristics, we have termed this a belief in internal control. (p. 1)

Since its conceptualization, locus of control has been related to academic achievement (Crandall, Katkovsky, & Crandall, 1965), information seeking (Davis & Phares, 1967), birth control practice (MacDonald, 1970), socioeconomic status (Lefcourt, 1966) and a host of other variables. As Phares (1976) indicated:

The most basic characteristic of internal individuals appears to be their greater efforts at coping with or attaining mastery over their environments. This is the most elemental deduction that could be made from the nature of the I-E variable. Fortunately this deduction has received widespread support from experiments with many different populations in a variety of situations. (p. 78)

Internals are generally more successful than externals at achievement-oriented tasks, especially cognitive ones. For example, as compared to externals, internals obtain better grades (Crandall et al., 1965), are better problem solvers (DuCette & Wolk, 1973), and utilize information more effectively (Seeman, 1963; Phares, 1968). However, relatively little is known about the social correlates of locus of control. It would be helpful to know the relationship, if any, between locus of control and peer acceptance. Perhaps internals are not only successful in school but also well-liked by their peers; or perhaps their superior achievement is compensation for the lack of social acceptance. Perhaps internals are more popular as working partners than they are as friends. It would also be helpful to understand the dynamics of interpersonal attraction with respect to locus of control. Perhaps internals and externals complement each other and become friends; or perhaps internals tend to associate with each other, and externals, with fellow externals.

It was the purpose of this study to investigate the possibilities mentioned in the preceding paragraph. More specifically the following questions were asked:

1. Are internal adolescents more popular than their external peers? (Are they selected more frequently as friends?)
2. Are internals more popular as working partners than they are as friends? (Do they receive more selections as working partners on an academic project than as friends?)
3. Do adolescents of a similar locus of control prefer each other as friends? (Do internals tend to select other internals, and externals, fellow externals?)

It was hypothesized that all of these questions would be answered in the affirmative. In the next section the significance of these hypotheses is discussed.

Significance of the Study

The theoretical and practical significance of this study are discussed separately in the subsections that follow.

Theoretical significance. The concept of locus of control (Rotter, 1966) emerged from Rotter's (1954) social learning theory. The cornerstone of Rotter's social learning theory is the principle that behavior is a function of expectancy (Phares, 1976). According to Rotter, one of the important factors that determines whether or not a behavior will occur is the expectancy that the behavior will help to produce a valued goal or outcome; the higher the expectancy the more likely the occurrence of the behavior. By definition (Rotter, 1966),

internals generally expect that their behavior will produce desired results, and, by definition, externals have a low expectancy that their behavior will make a difference. Therefore, internals should behave more effectively in goal-directed tasks. As previously mentioned, this postulate has received strong empirical support in situations that call for cognitive skill and mastery. However, the proposition has rarely been tested in a social situation.

If Rotter's principle (behavior is a function of expectancy) can be generalized from cognitive tasks to social ones, internals should be more effective friend-seekers; and their effective friend-seeking behavior should result in more friends. Thus, internals should have higher sociometric status than externals on a sociometric item that asks for "best friends."

The theoretical rationale for the first hypothesis of this study is Rotter's principle that behavior is a function of expectancy. In this case behavior is not measured directly, but rather, the inferred result of behavior (friends) is measured by sociometric testing. The expectancy variable is locus of control.

The rationale for the second hypothesis is an expansion of the rationale of the first hypothesis. Not only should internals be more effective friend-seekers, but they should also be perceived by their peers as being more competent at academic tasks. Thus, internals should receive some support (sociometric selections) on the basis of their hypothesized social superiority (first hypothesis), plus additional

support for their cognitive superiority. It is expected that the subjects will recognize the cognitive superiority of internals and choose them as working partners. Therefore, the second hypothesis is that internals have higher sociometric status on the task-oriented sociometric item than on the purely social item ("best friends").

The rationale for the third hypothesis stems from the research and theory in social psychology on interpersonal attraction. Newcomb (1956, 1961, 1968) and Byrne (1971) have shown that similarity in personality or attitude is a significant factor in interpersonal attraction. Although there are many exceptions, people tend to be attracted to those who are similar to themselves, especially if their similarity is reinforcing (Byrne, 1971) and creates interpersonal balance (Newcomb, 1968). According to Newcomb, a balanced relationship occurs when a person favorably evaluates another person and both agree in their evaluation of a third object or person. The similarity hypothesis (the proposition that similar people are attracted to each other) has been supported by a great deal of research (Byrne, 1971; Byrne & Griffitt, 1973).

The application of Newcomb's theory to locus of control suggests that internals and externals would not have a balanced relationship, because they would disagree on many important issues (for example, the existence of luck or fate and the value of planning). Based on Newcomb's theory, it was hypothesized that there would be a positive correlation between a person's locus of control and the locus of control of his friends.

Thus, this study has theoretical significance in that it tests an extension of a social learning principle (behavior is a function of expectancy) to a social situation. The study also tests the similarity hypothesis with respect to locus of control. The studies that support the theoretical rationale are discussed in the next chapter, the review of the literature. In the next subsection the educational significance of this study is discussed.

Educational significance. In the past 10 years educators have become very interested in locus of control. McGee and Crandall (1968), Brown and Strickland (1972), and Bartel (1971) found a positive relationship between internality and academic success. However, the well-known "Coleman Report" (Coleman, Campbell, Hobson, McPartland, Mood, Weinfield & York, 1966) has been the most significant factor in alerting educators to the significance of the locus of control variable. The authors of this report concluded that

A pupil attitude factor, which appears to have a stronger relationship to achievement than do all of the "school" factors together, is the extent to which an individual has some control over his destiny. (p. 23)

The evidence that internals tend to out-perform externals in school, coupled with the evidence that internals are better adjusted--psychologically--(Phares, 1976), has led many social scientists and educators to advocate changing externals to internals; for example, MacDonald (1973) wrote:

All of the research points to the same conclusion: people are handicapped by an external locus of control orientation. The prevailing belief is that it is desirable to change people, especially those who are not doing well in our society, in the direction of internality. (p. 170)

With this intention in mind, deCharms (1972), Stephens (1972), Reimanis and Schaefer (1970), Nowicki and Barnes (1973), Hawes (1971), and Ashton (1974) conducted experiments that were designed to help children become more internal. The results of their work indicate that certain methods help some people to become more internal and that this change coincides with academic improvement or improvement in skills related to academic success.

So far, the programs for changing locus of control have been of an experimental nature. However, a group of educators and social scientists (National Committee on Locus of Control and Self-Esteem, 1974) have recommended developing national norms for a locus of control test, so that it can be administered to all public school students. This standardized test would be used to measure growth in locus of control (becoming more internal); teachers would be expected to improve locus of control scores, as they are expected to improve their students' academic achievement scores. The committee also recommended several strategies for increasing internality.

Considering the movement toward internality training, an investigation of the social correlates becomes crucial. If educators plan to help students become more internal, they should know all that entails. In this respect, this study should help in the following ways:

1. If the results of this study indicate that internals have very few friends, educators need to systematically and thoroughly investigate the social adjustment of internals, before initiating any large-scale attempts to help students become more internal. Perhaps gains in achievement are not worth possible social maladjustment.

2. If the results of this study do not suggest that internals are inadequate socially, educators can proceed with a little more confidence in planning internality change programs.

3. If this study indicates that internality is positively related to sociometric status and if subsequent experimental studies indicate a cause-effect relationship between these two variables, programs designed to increase internality can be used to increase sociometric status, and/or programs designed to increase sociometric status (Northway, 1944; Gronlund, 1959; Drabman & Lahey, 1974) can be used to increase internality. Or, better yet, intervention programs can be designed to work on both locus of control and peer acceptance.

4. If the third hypothesis is confirmed, indicating that externals tend to associate with each other; it is likely that they perpetuate their own externality through mutual reinforcement (Byrne, 1971) and modeling. Thus, locus of control intervention programs could help externals become more internal by structuring experiences where they would interact with internals. Since externals are more persuadable (Ritchie & Phares, 1969; Ryckman, Rodda & Sherman, 1972) and more

conforming (Crowne & Liverant, 1963) than internals, it is more likely that internals would influence externals than the converse.

Thus, the study has practical significance in that it provides educators with data about the social relationships of internals and externals. These data are especially important now, because many educators are thinking about increasing internal control in students. Before educators begin to enact these plans, they need to know all that it entails. Assuming that this study and subsequent studies indicate that internals are not socially inadequate, this study may suggest grouping techniques for helping externals to become more internal. Thus, this study has both theoretical and practical significance.

There are some limitations to the rationale of this study, and they are discussed in the concluding section of this chapter. However, before the assumptions and limitations are discussed, key terms are defined in the section that follows.

Definition of Terms

The key terms used in this study are defined below. When appropriate, operational definitions are stated following the theoretical definitions.

1. Locus of control is a psychological construct that can be viewed as a continuum reflecting the degree to which an individual

expects that his reinforcement is contingent upon his behavior. At one end of the continuum is the expectancy that reinforcement is contingent entirely upon one's behavior or aptitude (internality); at the other end is the expectancy that reinforcement is not at all contingent upon one's behavior, but rather, reinforcement is attributed to luck, fate or powerful others (externality). Rotter's (1966) definition of locus of control is cited on page 1 of this report. Operationally, locus of control is defined as the score the subjects receive on the Nowicki-Strickland Locus of Control Scale for Children (N-S).

2. An internal is an individual who generally expects that his reinforcement is contingent upon his behavior or aptitude. In this study an internal is any subject who scores in the lowest third of this sample on the N-S.

3. An external is an individual who generally expects that his reinforcement is not contingent upon his behavior and aptitude, attributing it to luck, fate or powerful others. For the purpose of this study, an external will be operationally defined as a subject who scores in the top third of this sample on the N-S.

4. A moderate is an individual who is not clearly internal or external. In this study a moderate is a subject who scores in the middle third on the N-S.

5. Sociometry is the method of determining social acceptance by asking subjects to list associates with whom they would like to

participate in a certain activity. This technique, developed by Moreno (1934), is discussed in more detail in the third chapter.

6. Sociometric status is one's relative position on a sociometric test; that is, it is the number of selections one receives in comparison to his peers.

7. High sociometric status is the state of receiving many selections on a sociometric test, relative to one's peers. In this study high sociometric status is considered the upper quartile of all subjects ranked on the basis of the number of selections that they have received. Researchers have used the term "high sociometric status" interchangeably with "peer acceptance" (Adinolfi, 1970) and "popularity" (Horowitz, 1967). This author will also use these terms interchangeably, especially in the review of the literature.

8. Low sociometric status is the state of receiving few or no selections from one's peers on a sociometric test. In this study low sociometric status is operationally defined as the lowest quartile of subjects ranked according to the numbers of selections they received.

Assumptions and Limitations

Much of the theoretical relevance of this study is based on the assumption that both internal and external adolescents value friendship. When Rotter (1954) postulated that behavior is a function of expectancy, he included the value of the reinforcement in his formula. Thus, in situations where it is expected that behavior will produce

reinforcement and the reinforcement is valued, behavior is likely to occur. For this study it is assumed that the need for peer acceptance in early adolescence is so pervasive in our culture that (1) internals and externals value friendship equally (although there may be some externals who do not value friendship highly, there should be about the same number of internals who do not value friendship highly), or that (2) if there are differences between internals and externals in the amount they value friendship, these differences are not nearly as great as their difference in locus of control.

Also, the theoretical rationale is based on the assumption that friendships are, in part, a product of behavior. This postulate has been supported by sociometric research in that individuals of different sociometric status behave differently toward peers (Gronlund, 1959; Cole & Hall, 1970) and that training an individual in social skills can increase his sociometric status (Gronlund, 1959).

It is also assumed that a generalized measure of locus of control (the N-S) includes social relationships and that the total locus of control score reflects one's sense of control over social relationships. The multidimensionality of locus of control is a concern; a number of investigators (Mirels, 1970; Abrahamson, Schulderman & Schulderman, 1973; Gurin, Gurin, Lao & Beattie, 1969), by using factor analysis, have found that locus of control contains several dimensions. For example, Mirels (1970) found two factors, personal control (feelings of personal efficacy) and political control (ability to affect the

political system). According to social learning theory (Phares, 1976), a situation-specific measure of locus of control would be more effective than a generalized measure in predicting behavior relevant to that situation. Therefore, for this study the instrument that measured the subjects' feelings of control about their peer relationships would be ideal. Unfortunately, no such instrument exists. There are several items on the N-S that relate to peer acceptance, for example, item # 25: "Do you believe whether or not people like you depends on how you act?" (see Appendix A). However, Nowicki (1973) has factor analyzed the N-S and found no substantial factor that represents a sense of control over social situations. Therefore, out of necessity, a global locus of control score is used to predict sociometric status, and it is assumed that this global score reflects the subjects' sense of control over their interpersonal relationships. In other words, it is assumed that there is a high correlation between adolescents' global locus of control and their locus of control about social relationships.

Concerning the practical significance of this study, it is assumed that at least a minimum of friends is healthy and desirable for eighth graders, and conversely that the absence of friends is not a desirable condition for adolescents.

This study is limited, by intention, in that it is an exploratory investigation of the relationship between two broad and general traits. This study is not intended to tease out precise relationships between

locus of control, peer interaction and other variables; but rather, it represents a necessary forerunner to such studies; it is expected that this study will generate hypotheses about more precise relationships between locus of control and adolescent peer interaction. Considering the broad scope of this study, some of its limitations are discussed below:

1. Due to the correlational nature of this study, a cause-effect relationship between locus of control and peer acceptance cannot be inferred.
2. Sociometric procedures do not indicate the quality of a friendship. Perhaps internals have more friends, while externals have fewer, but qualitatively superior, friendships which could be more intimate, more loyal, or more enjoyable.
3. Both the N-S and sociometric testing are self-report inventories and are subject to the criticisms inherent in that technique; the main criticism being that subjects, consciously or unconsciously, report inaccurately.

In this chapter the purpose, rationale, and limitations of this study have been discussed. The next chapter reviews the literature relevant to the three hypotheses of this study.

CHAPTER II REVIEW OF THE LITERATURE

Locus of control is a relatively new concept; most of the research on this variable has been conducted in the past 15 years. On the other hand, sociometric research was popular from about 1935 to 1950; since then, interest in sociometry has waned. As a result, there have been very few studies (Nowicki & Roundtree, 1971; Adinolfi, 1970) that have directly related locus of control to a sociometric variable.

Considering the paucity of evidence that directly relates sociometric variables to locus of control, most of the literature reviewed for this study consists of indirect support of the hypotheses. For example, locus of control has been related to some variables that resemble or are related to sociometric status, and sociometric status has been related to personal variables that are similar to locus of control or related to it. These studies are discussed in this chapter, together with the few studies that provide more direct evidence. The literature is reviewed as it relates to each hypothesis.

First Hypothesis: Internals Have More Friends than Externals

Internality has been related to several social variables that suggest internals should be more popular. For example, Midlarsky (1971)

found that internals were more helpful to strangers than were externals. In Midlarsky's experiment each subject performed a task in the presence of an accomplice of the experimenter. Each person was assigned a task and was told that he could help the other person if he finished first. The experiment was designed so that the true subject always finished first. The internal subjects helped the accomplice significantly more than the external subjects did. If internals are also more helpful in their daily interactions, they should be more popular than externals, because helpfulness has been associated with high sociometric status (Reader & English, 1947; Cole & Hall, 1970).

Not only are externals less helpful than internals, but there is also some evidence that externals desire more social distance than internals, especially with strangers (Duke, 1973; Duke & Nowicki, 1972; Duke & Fenhagen, 1975). In the Duke and Nowicki study subjects used the Comfortable Interpersonal Distance Scale (CID) to indicate the distance at which hypothetical people should stop when approaching them; externals required more distance for strangers than did internals. Duke and Fenhagen (1975) administered the N-S and the CID to a group of adolescent females; they found that externality was associated with a greater preference for social distance. This suggests that externals may be uncomfortable in social relationships, especially new ones, and be less likely to interact with people and, therefore, less likely to have friends.

Another reason for the hypothesized popularity of internals is the finding that internality is more socially desirable than externality

(Bernhardson, 1968; Cone, 1971; Hjelle, 1971). Although earlier studies have found no relationship between social desirability and locus of control (Strickland, 1965; Tolor, 1967; Tolor & Jalowiec, 1968), the most recent evidence indicates that there is a moderate relationship between internality and social desirability (Cone, 1971; Hjelle, 1971). The social desirability of a trait or the instrument that measures the trait has been assessed in two ways. One method is to have judges rate the social desirability of the items of an instrument. For example, a judge rating the fourth item of the N-S (item # 4. "Most of the time do you feel that getting good grades means a great deal to you?") might conclude that a "yes" response is more socially desirable than a "no" response. In other words, it is desirable in this society to care a great deal about one's grades. Using this method, Hjelle (1971) and Bernhardson (1968) found that an internal view is more socially desirable than an external view. Hjelle's finding suggests that, since the internal point of view is valued more in this culture, people who have this point of view should be more accepted and popular than people who have the opposite point of view.

The second, and more frequently used, method of assessing social desirability has been to use a standardized instrument. The Edwards Social Desirability Scale (Edwards, 1957) and the Marlow-Crowne Social Desirability Scale (Crowne & Marlow, 1964) are self-report inventories that consist of items that mention socially

desirable or undesirable traits. Subjects who answer many items in the socially desirable direction are describing themselves as an ideal person. Cone (1971) correlated the locus of control scores on the Edwards Social Desirability Scale; in all five samples internality was associated with high social desirability. Cone concluded that internals may behave in a socially acceptable manner so that they can influence people favorably. This conclusion supports the rationale of the first hypothesis of this study, in that it suggests that internals believe they can affect their social environment and act accordingly. If this is true, internals should be more socially competent than externals and should be more popular.

There have been two studies (Phares & Wilson, 1971; Nowicki & Blumberg, 1975) that have related locus of control to interpersonal attraction. Of course, these are directly related to the third hypothesis (and are discussed in that context later in this chapter), but the unexpected results of these two studies lend support to the first hypothesis.

In the first of these two studies, Phares and Wilson (1971) asked internal and external college students to evaluate an alleged stranger based on his responses to Rotter's Internal-External Locus of Control Scale (Rotter, 1966). Actually there were no strangers, only two Internal-External scales--one completed in a totally internal direction and the other in a totally external direction. The internal subjects favored the internal "stranger," and the externals, as a group, did not favor either.

As a follow-up to the Phares and Wilson study, Nowicki and Blumberg (1975) carefully prepared four tapes, two of a male and female internal discussing their views and two tapes of their external counterparts. All four tapes were judged by the subjects and independent raters to express accurately the intended locus of control orientation. Forty college students were asked to judge the alleged strangers on three criteria: (1) their general likability, (2) their desirability as a working partner, and (3) their desirability as a roommate. The internal "stranger" was significantly more attractive to both the internal and the external subjects on three criteria, but especially on the third (desirability as a roommate). The Phares and Wilson study and the Nowicki and Blumberg study suggested that, since internals are preferred in an experimental situation, they should also be more popular in a real-life situation, like a classroom.

Before discussing the two studies that directly relate locus of control to sociometric status, the indirect evidence is summarized below in support of the hypothesis that internals are more popular than externals. This research indicates that

1. Internals are more helpful.
2. Internals require less personal space or social distance.
3. Internality is a more desirable trait in this society.
4. In experiments where subjects were asked to express their preference for either an internal or an external "stranger" most subjects preferred the internal.

The fourth point seems to offer the strongest support for the hypothesis. However, both of these studies (Phares & Wilson, 1971; Nowicki & Roundtree, 1975) were conducted under simulated conditions with alleged strangers. The present study is concerned with on-going relationships. Unfortunately, there is very little investigation relating locus of control to real, on-going friendships. The extensive literature review of this author has yielded only two such studies.

In the first of these studies, Nowicki and Roundtree (1971) administered the N-S and two sociometric questions to a sample of 12th graders ($N = 87$). The first sociometric item asked the students to list five classmates that would be good candidates for classroom president; the second item asked the subjects to list five of their best friends. Among males there was a significant relationship between internality and nominations for class president, but there was no relationship between locus of control and friendship. In other words, internal males received more selections as class president than did external males, but internals of either sex were no more popular than externals as friends.

In the second of these studies, Adinolfi (1970) administered a sociometric test to 600 college dormitory residents. From this subject pool he selected four groups of 30 subjects each (15 males and 15 females)--a highly accepted group, an unaccepted group, a rejected group, and a control group. Then these subjects ($N = 120$) were administered the Rotter Internal-External Locus of Control Scale

and several other personality tests. Among these four groups there were no differences in locus of control scores.

The results of these two studies are contrary to the first hypothesis of this study. However, it is expected that this study will produce results different from those of Nowicki and Roundtree and Adinolfi for the following reasons:

1. Their subjects were older than the subjects of this study. According to studies by Costanzo and Shaw (1966) and Brownstone and Willis (1971), younger adolescents are more influenced by their peers than are older adolescents. This suggests that peer acceptance is probably more important for a 13-year-old than for an 18-year-old. Since peer acceptance is a crucial, ego-involved need for a 13-year-old, it is likely that peer acceptance is related to his sense of potency and control.

2. Adinolfi's subjects were volunteers from the original subject pool; they were not randomly selected from their group. Campbell and Stanley (1966) cited the use of volunteers as a possible source of invalidity.

3. The previously mentioned locus of control studies suggest that internals are more likable.

4. Many sociometric studies have related sociometric status to personal variables that either resemble locus of control or have been related to it. Many of these studies have used subjects similar in

age to the subject of this study in the same social environment, the classroom. These studies constitute the remainder of the review of the literature for the first hypothesis and are reviewed in the paragraphs that follow.

A review of sociometric literature reveals two groups of studies that support the hypothesis that sociometric status is related to locus of control. Firstly, there are two clinically based studies (Northway, 1944; Northway & Wigdor, 1947) that produced descriptions of sociometrically high and low students that, in part, closely resemble theoretical and empirical descriptions of internals and externals, respectively. Secondly, sociometric status has been related to many variables (e.g., self-esteem) that have also been related to locus of control, such that internals parallel sociometrically high subjects (e.g., high in self-esteem) and externals parallel the sociometrically low (e.g., low in self-esteem).

Using the Rorschach test, Northway and Wigdor (1947) studied eighth graders of high, average, and low sociometric status. The well-liked subjects were described as having

. . . a greater sensitivity . . . to their environment--almost an active, conscious striving in using the "feeling tone" and social contacts of a situation to further their ends. (p. 194)

It is logical to expect that an individual who believes that he is in control of a situation will be more sensitive to and manipulative

of the environment. There is abundant evidence that internals are more alert to environmental cues and better able to use these cues than their external counterparts (Seeman & Evans, 1962; Seeman, 1963, 1966, 1967; Phares, 1968; Lefcourt & Wine, 1969; Williams & Stack, 1972). For example, Seeman (1963) found that internal prison mates were more knowledgeable about parole policy than external inmates of similar intelligence. Seeman concluded that internals had more actively sought and more efficiently processed information that might help them.

After reviewing the studies mentioned in the preceding paragraph, Phares (1976) concluded that "internals seem to be eager to seek out clues and to manipulate the situation so as to be better able to achieve certain outcomes" (p. 63). Thus, Northway and Wigdor's description of the well-liked eighth graders suggests that they are social internals; that is, they actively seek out clues in the social environment and use these clues rather effectively, as evidenced by their social success.

In the second of the clinically based studies, Northway (1944) conducted an in-depth study of sociometrically low fifth and sixth graders. Her results provided a holistic view of the personality types of students who are not well accepted by their peers; these personality profiles suggest relationships between low sociometric status and locus of control. For two years Northway collected data on 20 unpopular subjects through school records, interviews with parents, intelligence tests, psychological interviews, classroom and

playground observation, and sociometric tests. Her investigation yielded three types of unaccepted children. Of these 20 subjects six were "recessive children" who were described as "listless, lacking vitality, unhealthy, below normal in intelligence or underachieving, unkempt, and seemingly uninterested in people, activity, or events of the outside world."

There were nine "socially uninterested children" who Northway described in the following manner:

These children superficially appear to be similar to the truly recessive children. They are not liked by others nor do they appear to make an effort in either formal class activities or social affairs of the school. They are often quiet and retiring. However, on closer examination it is found that they are much better developed in their care of person and possessions and that they have interests. Those interests are personal rather than social. A child's energy may be directed towards art, music, science, hobbies, reading or to affairs of the home. Some of these children are merely quiet with and uninterested in other children; some are shy and uncomfortable with them, some are bored and critical of them, and some are rather objectively and impersonally interested in observing what other children do without in any way attempting to participate with them. (p. 458)

The third group consisted of five "socially ineffective children" who were described in the following manner:

Children of this group differ completely in their superficial behavior from the former group; they are often noisy, rebellious, delinquent in classroom affairs, boastful and arrogant. They are a nuisance to the teacher and the life of the classroom. They are diametrically opposed to the recessive children. However, this is not true, for they have in common the lack of acceptance by

classmates and these manifested forms of behavior seem to have arisen as rather ineffective, naive attempts to overcome the basic social insecurity and isolation from group life that they experience. They have vitality and are keenly interested in social affairs, but because of failure in the establishment of social relations, they make effortful, conspicuous, and often foolish and futile attempts to be recognized and accepted by the social group. (Northway, 1944, p. 458)

Northway supplemented these psychological profiles with two case studies from each group. The recessive state described by Northway closely parallels Seligman's (1976) concept of learned helplessness. Learned helplessness is a state that in human subjects greatly resembles reactive depression (Seligman, 1973) and is caused by an individual's learning that there is no relationship between his behavior and what happens to him. Seligman (1973) and Miller and Seligman (1973) have related learned helplessness to locus of control. It seems that learned helplessness is an extreme case of externality.

Thus, it is likely that the recessive children are inactive and listless because they have come to believe that they have little or no control over what happens to them. Recessive subjects should have a very external generalized locus of control and should score highly on the Nowicki-Strickland Scale.

Northway's description of the "socially uninterested" subjects suggests that they have an external locus of control in social matters, but an internal locus of control in personal matters. That is, they probably expect that they can control most things that they do alone,

but they doubt their ability to affect other people, especially their peers. The sample of this study will probably include some socially uninterested adolescents; it is expected that they will obtain low to moderate scores on the N-S, because they should answer the social items internally and the nonsocial items externally. Seven of the 40 items are clearly concerned with peer involvement.

"Socially ineffective children" seem to have a strong desire to affect their peers, but lack the skill and self-confidence to affect them positively. Northway's description and case studies suggest that these subjects have deeply rooted, but disguised, feelings of inferiority; and their verbal reports and behavior are often attempts to compensate for their inadequacy. These subjects have a social and probably generalized external locus of control; but their verbal reports are likely not to indicate this, so their N-S scores could vary greatly.

Northway's study suggests that although there is a general trend for almost all socially unaccepted children to have an external locus of control in social matters, this trend will be obscured by the non-social internality of the "socially uninterested" and the defensiveness of the "socially ineffective." Therefore, only a moderate correlation should be expected between sociometric status and the N-S scores of this sample.

There is some less direct, but statistically based, evidence supporting the hypothesis that socially accepted adolescents tend to

be more internal. This evidence is the list of traits that have been significantly related to both sociometric status and locus of control. Of course, just because two variables are related to a third variable is no indication that they are necessarily related to each other; but if two psychological variables are related to several variables, it is likely that these two variables are related to each other.

As previously mentioned, sociometric status has been related to academic achievement (Bonney, 1943; Grossman & Wrighter, 1948; Brown, 1954; Feinberg, 1953) and socioeconomic status (Brown, 1954; Cook, 1945; Neugarten, 1946; Grossman & Wrighter, 1948). Locus of control is also related to academic achievement (Coleman et al., 1966; Crandall et al., 1965) and socioeconomic status (Lefcourt, 1966).

Sociometric status is clearly related to self-concept (Baron, 1951; Guardo, 1969; Horowitz, 1962; Reese, 1961; Videback, 1960), as is locus on control (Fitch, 1970; Fish & Karabenick, 1971); and sociometric status is negatively correlated with anxiety (Baron, 1951; Mill, 1953), as is locus of control (Butterfield, 1964; Watson, 1967; Feather, 1967; Ray & Katahn, 1968). Subjects of low sociometric status have been found to be depressed (Baron, 1951; Northway, 1944), as have externals (Abramowitz, 1969; Miller & Seligman, 1973). Low sociometric status has been associated with schizophrenic tendencies (Northway, 1944; Northway & Widgor, 1947) and so has externality (Cromwell, Rosenthal, Shakow & Zahn, 1961; Harrow & Ferante, 1969). With all of these traits in common it is likely that most adolescents of high sociometric status are internal, and most adolescents of low sociometric status are external.

Before presenting the literature relevant to the second hypothesis, this section is summarized below:

1. Internals should be more popular than externals, because they are more helpful, require less social distance, and possess a viewpoint that is valued more by this culture.
2. In two experimental studies (Phares & Wilson, 1971; Nowicki & Blumberg, 1975) subjects preferred an internal "stranger" to an external "stranger."
3. Two studies (Nowicki & Roundtree, 1971; Adinolfi, 1970) have found no relationship between locus of control and sociometric status for older adolescents.
4. Two studies (Northway, 1944; Northway & Wigdor, 1947) have produced clinical descriptions of students of high and low sociometric status; these descriptions resemble internals and externals, respectively.
5. Internals have many traits in common with subjects of high sociometric status. As compared to externals and unpopular subjects, internals and popular subjects tend to do better in school, come from families of higher socioeconomic status, have positive self-concepts, less anxiety, less depression, and less schizophrenic tendencies.

In the next section the literature relevant to the second hypothesis is reviewed.

Second Hypothesis: Internals are More Popular on a Task-Oriented Sociometric Item than on a Purely Social One

The second hypothesis compares the sociometric status of internals on two different items: (1) "Name the students who are your best friends" and (2) "If you had a group project in English (class) with three other students, and half of your grade depended on this project, which three students would you select to work with?" (These two items are referred to as the "best friends" item and the "work-project" item, respectively.)

The second hypothesis is that internals have higher sociometric status on the work-project item than on the best friends item. The rationale for this hypothesis is based on two well-documented findings: (1) the nature of the sociometric item affects who is popular and who is not, and (2) internals are academically superior to externals.

The difference in the nature of the sociometric items, relative to this hypothesis has been discussed by Jennings (1947). She suggested that there are two types of sociometric items, those related to an informal, personal situation (like the best friends item) and those related to more formal situations that usually involve a group project (such as the work-project item); Jennings suggested that these two types of items tap two underlying group structures, an informal system and a formal system, respectively. According to Jennings, choices on items that tap the formal system are based more on ability and less on social popularity than are choices on items related to the informal system.

Jennings conclusion has been supported by Gronlund. After reviewing several studies that compared sociometric status on different type items, Gronlund (1959) concluded that there is a general social acceptability factor for all items, but that

Where specific criteria indicate the need for knowledge or skill, the social acceptability factor is suppressed somewhat, in the choosing, in factor of success in the activity. (p. 138)

Thus, in this study it was expected that the academically competent students would have higher sociometric status on the working-project item than on the best friends item. Since internals are better represented among the academically competent, it was expected that they would have higher sociometric status on the work-project item than on the best friends item.

The studies which indicated that internals are academically superior to externals were cited in the first chapter (Crandall et al., 1965; McGee & Crandall, 1968; Brown & Strickland, 1972; Bartel, 1971; Coleman et al., 1966). These studies were correlational. For example, Crandall and her associates studied the relationship between locus of control and school grades for students from the third through 12th grades. Internal males averaged 2.54 (on the 4.0 system), and external males averaged 2.26; and internal males averaged 2.95, and external females 2.70. The grades of the internal students were significantly ($p < .01$) higher than the externals' grades.

Several experimental studies (deCharms, 1972; Hawes, 1971; Stephens, 1972; Ashton, 1974) have also found a relationship between sense of control and academic performance. For example, deCharms (1972) investigated the relationship between academic performance and "personal causation" which he defined as "the initiation by an individual of behavior intended to produce a change in his environment." Personal causation is similar to locus of control in that they are concerned with an individual taking control of his environment. Theoretically, personal causation is concerned with intrinsic motivation, and locus of control is concerned with expectancies about external reinforcement; but Phares (1976) and Lefcourt (1966) have noted that there is a great deal of overlap between these two concepts. Thus, deCharms' experiment has relevance to locus of control. In this study, he and his associates randomly assigned half of the sixth grade teachers ($N = 16$) in an urban school district to an experimental group; the other half constituted the control group. The experimental group underwent "personal causation training", which was a program designed to facilitate "origin" behavior among the teachers and the students they taught. ("Origin" is a term that is similar to "internal.") After the training sessions, the teachers conducted similar sessions in their classrooms for the next two academic years. The results of the study indicate that the experimental group, as compared to the control group, had students who (1) rated their classrooms as more conducive to independent, self-motivated study, (2) scored higher--more origin (internal)--on deCharms' Origin-Pawn measure, and (3) scored higher on standardized achievement tests.

Thus, the relationship between internality and high academic achievement has been clearly established. Although there are exceptions, internals generally perform better in school than their external counterparts.

In this section it has been argued that the best friends sociometric item favors students who are academically competent. Since internals are generally academically superior to externals, they should have higher sociometric status on the work-project item. Also, internals should have higher status on the work-project item than on the best friends item, because of their academic superiority.

This researcher has been able to find only one study that has related locus of control to two different sociometric items. In this study, which was mentioned in the previous section, Nowicki and Roundtree (1971) related the locus of control of 12th graders to their sociometric status on a best friends item and on an item that asked for good candidates for class president. Nowicki and Roundtree's study is comparable to this one, since the first item is identical to the first item of this study, and the second item is related to the second item of this study in that they both have to do with achievement oriented activities. The results of the Nowicki and Roundtree study supported the second hypothesis of this study in that internals, at least the internal males, had higher sociometric status on the class president item than on the best friends item.

Thus, the hypothesis that internals should do better on a task related item than on a purely social sociometric item has received

partial support. In the next section the literature relevant to the last hypothesis is discussed

Third Hypothesis: People Prefer, as Friends, Those Who Are Similar to Them in Locus of Control

Interpersonal attraction is one of the most studied phenomena in social psychology. Laymen and psychologists alike have been curious about why people are attracted to some people and not others. One of the simplest explanations is that people prefer those who are similar to themselves. There is abundant empirical evidence that this explanation has some validity (Byrne, 1961; Byrne & Griffitt, 1973; Newcomb, 1961), but only under certain conditions and only for certain traits.

The proposition that people are attracted to those who are similar to themselves in attitude and personality has been called the "similarity hypothesis." Byrne and Griffitt (1973) have described three methods that have been used to test the similarity hypothesis, as follows:

Three basic research designs have been used to study the influence of personality similarity on attraction. In one approach, existing attraction pairs such as friends, or spouses are selected and then assessed with respect to one or more personality variables; the scores of the series of pairs are correlated. In a second approach, the personality measure or measures are obtained, and then previously unacquainted subjects are selected on the basis of their test scores and placed in an interactive situation, followed by an

assessment of their attraction. . . . In research utilizing a third design. . . the subject's personality relevant behavior consists of his response to the instrument used to assess personality characteristics, and he is subsequently exposed to the responses of the target on the same instrument with other stimulus and elements controlled experimentally. With this design it has been shown that attraction is positively related to similarity. (pp. 320-321)

By using the third design it has been shown that people are attracted to those who are similar to themselves in self-concept (Griffitt, 1966, 1969), the need for approval (Goldstein & Rosenfeld, 1969), and dominance-submissiveness (Palmer & Byrne, 1970).

The third design has been used to test the similarity hypothesis for locus of control in two studies, mentioned previously in this chapter. In the first of these studies, Phares and Wilson (1971) tested the hypothesis that internals are attracted to other internals and that externals are attracted to fellow externals. As previously mentioned their hypothesis was only partially confirmed; although the internal subjects did prefer the internal "stranger," or the externals showed no preference for either the internal or the external "stranger."

In the second of these studies, Nowicki and Blumberg (1975) hypothesized that Phares and Wilson did not confirm the similarity hypothesis, because the technique they used was "less than realistic." They tested the same hypothesis using audio tapes, instead of completed Rotter scales. The hypothesis was still not confirmed; both the internal and the external subjects preferred the internal "stranger."

In these two experiments the failure to confirm the hypothesis may be due to the highly contrived conditions and the social desirability of locus of control. Under these conditions, the subjects may simply choose the person that seems more socially desirable rather than choose the person that would really be a good friend.

Most of the studies that have supported the similarity hypothesis and the studies by Phares and Wilson and Nowicki and Blumberg belong to the third category described by Byrne and Griffitt (1973). These studies have two factors in common: (1) their method of eliciting interpersonal attraction is highly contrived, and (2) they measure only initial attraction (first impression).

There have been some studies without these shortcomings, the most noted being Newcomb's (1961) study. Newcomb invited 34 male students transferring to the University of Michigan to live together in a house near campus. In exchange for this rent-free opportunity, the students agreed to participate in a research project which entailed regular testing and interviewing. As mentioned previously, Newcomb found that initial attraction was highly related to propinquity; generally the closer the rooms, the greater the chance of interpersonal attraction. However, later attraction was more strongly related to perceived similarity in attitudes. Newcomb's study suggests that individuals in a group who have had the opportunity to become acquainted with each other will associate with those group members whom they perceive as similar to themselves.

Sociometric testing has also been used to test the similarity hypothesis; this method is the first type described by Byrne and Griffitt (1973). The results of these studies have been inconsistent. For example, Pinter et al., 1937, studied the friendships of fifth through eighth graders and found that friends were not similar in ascendance-submission, emotional stability, and extroversion-introversion; and Thorpe found that classroom friends were not similar in neuroticism. However, Bonney (1945), Austin and Thompson (1948), and Van Dyne (1940) found that adolescents and young adults were more similar in personality to their friends than to nonfriends. In these studies the personality trait that the friends had in common was a social nature, namely social and emotional adjustment (Bonney, 1945), similarity of needs (Austin & Thompson, 1948), and degree of dominance and sociability (Van Dyne, 1940).

The study of interpersonal attraction is further complicated by the research of Winch (1958) which indicate that men and women of complementary traits are often attracted to each other and maintain good marital relationships. Although married couples tend to be similar in race, sociometric status, and religion, they often complement each other on certain personality traits, especially those related to dominance and submission, that is, people with dominant needs tend to marry partners with submissive needs.

Hollander (1967) has evaluated the research on interpersonal attraction and has concluded that

similarity is important for some kinds of relationships and complementary for others. In most studies where similarity is found to hold as a factor yielding a mutual bond, attitudes and values are those elements which are being measured. Complementary, on the other hand, may be relevant to need satisfaction in an enduring interaction. (p. 193)

The peer relationships of 13-year-olds, although powerful in an almost impersonal way, are still not so intimate and enduring (Horrocks, 1976) that complementary need satisfaction would likely be an overriding factor. It is only with mature, intimate relationships that complementary traits seem to be significant, as evidenced by the fact that the complementary hypothesis ("opposites attract" has been supported with research using married couples (Winch, 1958; Hollander, 1967)). Therefore, similarity in locus of control, rather than complementarity in locus of control, should be a significant factor in the peer relationships of young adolescents.

In the present study it is hypothesized that the social preferences of these subjects are related to perceived attitude similarity and that the constellation of attitudes significant to these 13-year-olds is related to their locus of control orientation. Therefore, it is predicted that there is a moderate, but significant, relationship between locus of control similarity and attraction; that is, the subjects should choose classmates who are similar to themselves in locus of control.

In this section there was a brief review of the literature investigating the similarity hypothesis. Studies were mentioned

which indicated that people tend to be attracted to those who are similar to themselves in self-concept, need for approval, and dominance-submissiveness. Two studies (Phares & Wilson, 1971; Nowicki & Blumberg, 1975) were discussed which tested and did not completely support the similarity hypothesis of locus of control. It was hypothesized that this study would support the similarity hypothesis for locus of control, because a more realistic method (sociometric testing) was used to elicit interpersonal attraction. In the next chapter the methodology of this study is discussed.

CHAPTER III METHODOLOGY

Two hundred eighth graders were administered a locus of control instrument and a sociometric questionnaire. The results were analyzed by multiple regression to investigate the following hypotheses:

1. With sex and race partialled out, there is a significant relationship between locus of control and sociometric status on the best friends item such that internals are more popular than externals.

2. With sex and race partialled out, there is a significant relationship between locus of control and sociometric status on the work-project item such that internals are more popular on this item than they are on the best friends item.

3. Also with sex and race partialled out, there is a significant relationship between the subjects' locus of control and the locus of control of their friends such that the subjects choose friends who are similar to themselves in locus of control.

Subjects

The subjects were 200 eighth graders from a middle school in a city in North Central Florida with a population of 10,000. According to the school administration, most of the school's students (80-85%) were

from families of lower middle and lower socioeconomic status. The sample included 112 females and 88 males, 161 whites and 39 blacks. The modal age was 13.

Testing Procedure

The sociometric test and the Nowicki-Strickland Locus of Control Scale for Children (N-S) were administered by two English teachers at the school in December of 1975. The teachers administered the forms to all of their classes which met during different class periods throughout the school day. The sociometric questionnaire was administered first, and the N-S was administered one week later with a battery of other tests. [The other data collected at this time were used in a study by Damico and Purkey (1976.)] The students were assured that their responses would remain confidential.

Instrumentation

The sociometric test. The first sociometric item used for this study was "Name the students who are your best friends." Three blank spaces were provided below the items. The subjects were not directed to list the friends in any specific order, nor were they explicitly told that three names were expected. The subjects could list fewer or more than three names, but most did list three and no more than three were analyzed in this study.

The other item was "If you had to work on a group project in English with three other students, and half of your grade depended

on this project, which three students would you select to work with?" Three blank spaces followed this item. There were several other sociometric questions on this form (see Appendix B), but they were not be analyzed in this study.

Although both the items used in this study are referred to as sociometric, this is not exactly correct. Lindzey and Byrne (1968) summarized Moreno's (1934) requirements of a sociometric test, as follows:

1. The limits of the group should be indicated to the subjects. For example, choices could be limited to members of a specific classroom.
2. The subjects should be permitted an unlimited number of choices.
3. The subjects should be asked to indicate the individuals whom they choose or reject in terms of a specific criterion. Each sociometric choice should be made with a meaningful activity in mind, for example, "name the students you would like to sit next to in class."
4. Results of the sociometric question should be used to restructure the group. Subjects should be told that their input will be used in making such decisions.
5. The subjects should be permitted to make their choices privately.
6. The questions used should be gauged to the level of understanding of the sample.

Although the work-project item fulfilled most of these requirements, the best friends item violated the second, third, and fourth requirements. The second requirement, unlimited choices, was violated on both items, because unlimited choices would be more difficult to manage in terms of statistical analysis. The third requirement, the use of a specific activity, was not used for the best friends item; because the first and third hypothesis of this study were intended to investigate long-term relationships. It was assumed that when adolescents were asked to list best friends, rather than to name peers with whom they would like to interact in some activity, their choices would be more likely to include actual relatively long-term friendships.

Lindzey and Byrne (1968) commented on the above-mentioned requirements as follows:

The requirements outlined above identify the sociometric measure in a more or less pure form, and are generally in agreement with Moreno's definition. However, relatively few studies in this area meet all the requirements. For example, the technique as used today seldom involves the promise of restructuring the group One of the more frequent modifications involves specifying the number of choices the individual is required to make. (p. 455)

Thus, sociometric studies are not uniform in their methodology. This poses a problem in assessing the reliability and validity of the technique. However, since pure applications of sociometric testing are the exception, rather than the rule, and since the variations of the pure form seem to yield similar results; they will all be considered

together, and the reliability and validity of sociometric testing (in its broad sense) will be said to apply to the procedure used in this study. In fact, most of the studies that have assessed the reliability and validity of sociometric tests have been variations of the pure form.

Concerning the reliability of sociometric testing, a point made by Gronlund (1959) needs to be considered:

perfect consistency from one test to another is neither expected nor desirable, owing to the dynamic nature of social relations. Revealing actual changes in social relations is as important a requirement of the sociometric test as providing results that are constant enough to have predictive value Thus, when applied to sociometric testing, the various coefficients of reliability refer to the consistency of choice behavior, . . . rather than to the characteristics of the test itself. (p. 119)

Thus, the changes in sociometric results do not necessarily reflect testing error; to a great extent they reflect actual changes in the social preferences of the subjects. With this point in mind, the internal consistency and the test-retest reliability of sociometric tests will be discussed.

Grossman and Wrighter (1948) determined the internal consistency of their sociometric testing with four classrooms of sixth graders. They randomly divided each group in half and then correlated the sociometric status of each subject, as rated by one half of the class, with his status in the other half of the class. They reported coefficients of internal consistency from .93 to .97. Bass and White (1950)

and Ricciuti and French (1951), using college students as subjects, reported internal reliability coefficients of .90. Ausubel, Schiff, and Gasser (1952) reported coefficients from .54 to .86 for third, fifth, and seventh graders and coefficients of .89 and .90 for 11th and 12th graders.

Test-retest reliability has been determined by correlating the sociometric status of subjects on one sociometric test with their status on another test at a later date. Witryol and Thompson (1953) and Thompson and Powell (1951) studied the consistency of sociometric choices made by sixth graders at intervals of one week, four weeks, and six weeks. Witryol and Thompson (1953) reported reliability coefficients ranging from .60 to .90, and Thompson and Powell (1951) reported correlations ranging from .89 to .92. In both studies, the coefficients tended to decrease over time.

Using longer time intervals, Byrd (1951) found a reliability coefficient of .89 with fourth graders selecting partners for a play after a two-month interval, and Gronlund (1955) reported an average reliability coefficient of .75 for fourth, fifth, and sixth graders over a four-month interval. Bonney (1943) administered a sociometric test, an IQ test, and an achievement test to a group of second graders for four consecutive years. The correlations of the students sociometric status from one year to the next ranged from .67 to .84. The sociometric status of the children in this study was as consistent as their IQ and scores on the achievement tests.

Using high school students Northway (1947) reported coefficients of .90 for a one-week interval and .60 for a one-year interval.

Jennings (1950) investigated the sociometric choices of adolescent girls (12 to 16 years old) over time and found a correlation of .96 after four days and a correlation of .65 after eight months.

Thus, the results of sociometric testing are relatively consistent. They are almost as reliable as typical intelligence and achievement tests, as Bonney (1943) has demonstrated, and more reliable than most attitude/personality measures.

As with reliability, the concept of validity, as it is typically applied to testing and measurement, needs to be qualified in its application to sociometric tests. If sociometric tests are supposed to measure merely social choice, then they are by definition valid (Pepinsky, 1949). However, if they are supposed to measure actual social relationships, they will certainly fall short of this expectation, because, as Gronlund (1959) has mentioned:

An individual's actual associations are influenced by environmental limitations, personal inhibitions, lack of reciprocal feelings on the part of the desired associates, and other related factors, as much as they are by his preferences. Thus actual associations can be expected to show some variation from the desired associations indicated in sociometric choices. (p. 159)

Although sociometric choices do not correspond perfectly with actual associations, there is a great deal of overlap. This overlap, sociometric choices that are also actual associations, is considered

evidence of the validity of sociometric testing for this study; because the first and third hypotheses of this study purport to study friendships. Studies that have investigated the validity of sociometric testing have related sociometric status and sociometric choices with other measures of popularity and friendship choices.

Concerning sociometric status, the observations of teachers and independent investigators correspond rather closely to the results of sociometric tests. Bonney and Powell (1953) found that sociometrically high first and second graders participated more frequently in cooperative group activities and associated with more children than did sociometrically low children. Newsletter, Feldstein, and Newcomb (1938) found a correlation of .76 between the sociometric status and the camp counselor ratings of popularity for 30 adolescent boys. Gronlund (1951) had 40 sixth grade teachers rank their students according to popularity; the average correlation between the teacher's ranking and sociometric results was .60. Gronlund (1955, 1956) obtained similar results in two other studies.

The individual choices of a subject are more complex and variable (Gronlund, 1959) than sociometric status. Therefore, it is more difficult to observe and less likely to correspond closely with sociometric results. Biehler (1954) compared the first sociometric choice of kindergarten children with their observed play companions. About 74 percent of the chosen companions actually played with the children who chose

them. Gage, Leavitt, and Stone (1955) asked 103 fourth, fifth, and sixth grade teachers to predict how each of their students would respond to a sociometric item that asked for the students to list five children in their room whom they would most prefer as classmates if the class were divided into two groups. The average correlation between the teacher's prediction and the sociometric results was .48.

Considering that observations are subject to error and that some aspects of friendship can not be observed, the above-mentioned evidence suggests that sociometric results correspond rather closely to actual friendships.

The Nowicki-Strickland Locus of Control Scale for Children (N-S)

Nowicki and Strickland (1973) developed the N-S (see Appendix A) as the children's counterpart to Rotter's (1966) Internal-External Locus of Control Scale; both scales were intended to be measures of global locus of control. Nowicki and Strickland (1973) describe the scale in the following manner:

The Nowicki-Strickland Locus of Control scale is a paper-and-pencil measure consisting of 40 questions that are answered either yes or no by placing a mark next to the question. This form of the measure derives from work which began with a large number of items ($N = 120$), constructed on the basis of Rotter's definition of the internal-external control of reinforcement dimension. The items describe reinforcement situations across interpersonal and motivational areas such as affiliation, achievement, and dependency. School teachers were consulted in the construction of items. The goal was to make

the items readable at the fifth-grade level, yet appropriate for older students. These items along with Rotter's description of the locus of control dimension were then given to a group of clinical psychology staff members ($N = 9$), who were asked to answer the items in an external direction. Items on which there was not complete agreement among the judges were dropped. This left 59 items, which made up the preliminary form of the test. The 59-item form of the test was then given to a sample of students ($N = 152$) ranging from the third through eleventh grades The results of further analysis as well as comments from teachers and subjects in the sample led to the present form of the test consisting of 40 items. (p. 151)

Split-half correlations correlated by the Spearman-Brown Formula were .63 for third to fifth grades, .68 for sixth to eighth grades, and .74 for ninth to eleventh grades; the sample size for each of these three groups was about 300. Test-retest reliabilities with six-week intervals was .63 for third graders, .66 for seventh graders, and .71 for tenth graders.

Nowicki and Strickland assessed the convergent validity of the N-S by correlating it with two measures of locus of control--the Intellectual Achievement Responsibility Questionnaire (Crandall et al., 1965) and the Bialer-Cromwell Scale (Bialer, 1961). With 182 third grade and 171 seventh grade blacks, the correlations between the Intellectual Achievement Responsibility Questionnaire and the N-S were .31 and .51, respectively. With a sample of 29 children, ages 9-11, the correlation between the Bialer-Cromwell Scale and the N-S was .41.

As evidence of the construct validity of the N-S, Nowicki and Strickland (1973) cited significant correlations between academic achievement and the N-S at varying age levels. They also demonstrated that internality, as measured by the N-S, increases with age and offered this trend as evidence of the validity of the instrument. Nowicki (1973) has also demonstrated the construct validity of his instrument by factor analyzing the test results of three different populations-- elementary school children, junior high school children, and high school children. For the sample most relevant to this study (junior high school subjects), there were three different factors. There was one general factor that accounted for 38 percent of the variance and was labeled "helplessness" (this factor was also present in the other two samples). The other two factors accounted for less variance, 8-19 percent; the second factor had to do with achievement, especially through persistence and planning, and the third factor contained items having to do with luck, persistence, and success in social areas.

Thus, it appears that part of the third factor (success in social areas) is most relevant in this study. However, since it is only part of one factor, contains only a few items, and accounts for so little variance, it has not been used to predict sociometric status in this study.

Although the N-S is a rather new instrument and lacks the validation research of a more established instrument, the sparse amount of evidence that is available suggests that it is about as reliable and

valid as most attitude/personality measures used in research.

MacDonald (1973) has evaluated most of the locus of control instruments and has noted:

This test has been developed carefully by researchers of solid reputation. Though of recent construction, it has been used in many studies. Results presently available indicate the scale to have adequate internal consistency and temporal consistency. Data relevant to divergent and convergent validity are encouraging. In short, it appears to be the best measure of locus of control as a generalized expectancy presently available for children. (p. 185)

Statistical Analysis

First and second hypotheses. In both of these hypotheses the dependent variable was sociometric status (SMS) on the respective sociometric item. Sociometric status was measured by counting the number of selections that each subject received. Previous sociometric research indicates that this distribution should be skewed to the right--fewer popular children than unpopular ones (Groulund, 1959).

The principal independent variable was locus of control (LOC), measured by the N-S. It was expected that this distribution would be close to normal or skewed slightly to the right; there may be more extreme internals than extreme externals (Nowicki & Strickland, 1973). The variables of sex and race were forced into the equation before LOC, as covariates, since sex and race may be confounding variables. Thus the basic multiple regression equation was as follows:

$$\hat{SMS} = \text{sex} + \text{race} + \text{LOC}$$

In addition to these basic variables, locus of control as a nonlinear variable (LOC^2) and interactions between locus of control and sex and race were also checked for significance; so the complete equation was as follows:

$$\hat{SMS} = \text{sex} + \text{race} + LOC + LOC^2 + (LOC \times \text{sex}) + (LOC \times \text{race})$$

All of the independent variables were forced into the equation in the order indicated above. The rationale for this approach has been discussed under the rubrics of the "a priori ordering approach" by Kerlinger & Pedhazur (1973).

Dummy coding (Kerlinger & Pedhazur, 1973) was used to code sex and race. The data were submitted on cards to the University of Florida's IBM 360-75 computer, assessing the multiple regression program of the Statistical Package for the Social Sciences (SPSS) (Nie, Hull, Steinbrenner & Bent, 1973). (In fact, all of the data analysis of this study used programs from the SPSS library). If the F-value was significant at the .05 level for the LOC variable, the hypothesis was accepted.

One of the assumptions of multiple regression is that the dependent variable should be normal. However, Kerlinger and Pedhazur, (1973) has noted that this is not always a problem:

It has convincingly been shown that the F and t tests are "strong" or "robust" statistics, which means that they resist violation of the assumptions. In general,

it is safe to say that we can ordinarily go ahead with analysis of variance and multiple regression analysis without worrying too much about assumptions. Nevertheless, researchers must be aware that serious violations of the assumptions, and especially of combinations of them, can destroy results. We advise students to examine data, especially by plotting, and, if the assumptions appear to be violated, to treat obtained results with even more caution than usual. The student should also bear in mind the possibility of transforming recalcitrant data, using one or more of the transformations that are available and that may make the data more amenable to analysis and inference.

If the dependent variables differ markedly from the normal distributions, they will be transformed, as Kerlinger has advised.

Third hypothesis. Multiple regression was also used in the analysis of the third hypothesis. For this equation the locus of control of the friends chosen by the subject (F-LOC) was the dependent variable. It is expected that the distribution of F-LOC scores should be close to normal, so none of the assumptions of multiple regression should be violated in the analysis of the third hypothesis.

With F-LOC scores as the dependent variable, the principal independent variable was the subject's own locus of control score. If there is a significant positive correlation between the two, it would indicate that these subjects tend to choose friends of a similar locus of control orientation. A negative correlation would indicate a tendency to choose friends of the opposite locus of control.

As with the first hypothesis, sex and race were forced into the equation before the principal independent variable (the subject's own LOC score). Also, interactions and a nonlinear relationship between LOC and F-LOC were investigated. Thus, the complete multiple regression equation was as follows:

$$\hat{F-LOC} = \text{sex} + \text{race} + \text{LOC} + \text{LOC}^2 + (\text{LOC} \times \text{sex}) + (\text{LOC} \times \text{race})$$

Chapter Summary

Two hundred eighth graders answered two sociometric questions: one that asked the students to list their best friends, and another that asked the student to name three classmates with whom they would like to work on an academic project. One week later the subjects completed the Nowicki-Strickland Locus of Control Scale for Children (N-S).

The reliability and validity of sociometric testing and the N-S were discussed; both testing procedures were as reliable and valid as most psychological tests used in research. The subject's locus of control (LOC) was the principal independent variable for all three hypotheses. LOC and other variables were used in the multiple regression equations to predict sociometric status on the best friends item (SMS_{bf}), sociometric status on the work-project item (SMS_{wp}), and the subject's friends locus of control (F-LOC). The complete multiple regression equations were as follows:

1. First hypothesis: $\hat{SMS}_{bf} = \text{sex} + \text{race} + LOC + LOC^2$
 $+ (LOC \times \text{sex}) + (LOC \times \text{race})$
2. Second hypothesis: $\hat{SMS}_{wp} = \text{sex} + \text{race} + LOC + LOC^2$
 $+ (LOC \times \text{sex}) + (LOC \times \text{race})$
3. Third hypothesis: $\hat{F-LOC} = \text{sex} + \text{race} + LOC + LOC^2$
 $+ (LOC \times \text{sex}) + (LOC \times \text{race})$

The results of this analysis are discussed in the next chapter.

CHAPTER IV RESULTS AND DISCUSSION

In this chapter the results of this study are stated and discussed. The first section presents the results, and in the next section the significance of these results is discussed.

Results

The results of this study are presented in sub-sections. The first sub-section is a general presentation of the data which includes the mean, standard deviation, and other aspects of the variables used in the study. The remaining three sub-sections present the results of the analysis of each hypothesis. These three sub-sections focus on the inferential statistics of each hypothesis, and the first sub-section focuses on the descriptive statistics of all of the variables.

Descriptive statistics. Two hundred subjects completed the Nowicki-Strickland Locus of Control Scale for Children (N-S). Scores on the N-S can range from 0 to 40--the higher the score, the more external. The mean score of this sample was 15.99; the standard deviation was 5.54. The scores ranged from 3 to 30. Measures of the skewness and kurtosis were taken and found to be -.22 and .20, respectively, indicating that the distribution of N-S scores was close to normal.

The sample included 112 females and 88 males, 161 whites and 39 blacks. The female subjects had a mean N-S score of 15.21, and the males, 16.96. (The lower the score, the more internal.) The mean score for whites was 15.32, and for blacks it was 18.72. The sex/race differences are presented in Table 4-1.

Table 4-1. Sex/race differences in locus of control scores

Subgroup	<u>N</u>	Mean	Standard Deviation
White males	69	16.18	5.47
Black males	19	19.79	4.93
All males	88	16.96	5.31
White females	92	14.67	5.39
Black females	20	17.70	5.15
All females	112	15.21	5.32
All whites	161	15.32	5.42
All blacks	39	18.72	5.04

Sociometric status was measured by counting the number of selections received. For the first hypothesis sociometric status on the best friends item (SMS_{bf}) was the dependent variable. The mean number of selections received was 2.38; the standard deviation was 1.92. The most popular subjects ($\underline{N} = 2$) received nine selections;

that is, nine of their classmates chose them as best friends. Thirty-three subjects received no selections. Thus, SMS_{bf} ranged from zero to nine. The measures of skewness and kurtosis were .97 and 1.03, respectively.

For the second hypothesis sociometric status on the work-project item (SMS_{wp}) was the dependent variable. The mean number of selections received was 2.49; the standard deviation was 2.41. On this item the most popular subject received 13 selections, and 41 subjects received no choices. The measures of skewness and kurtosis were 1.53 and 3.14 for this variable. Like SMS_{bf} , SMS_{wp} was not significantly related to either sex or race.

The indices of skewness and kurtosis indicated that SMS_{bf} and SMS_{wp} deviated considerably from a normal distribution (Nie et al., 1975). Therefore, both distributions were transformed to T-scores, a procedure commonly used to normalize recalcitrant data (Roscoe, 1969). The transformed variables which were used in the multiple regression equations were labeled SM_{bf} and SM_{wp} . The correlation between SM_{bf} and SM_{wp} was .675.

Relevant to the third hypothesis, the 200 subjects of this study made 413 usable choices on the best friends item (some subjects chose friends who did not take the N-S, and these choices could not be used). Of the 413 selections, 386 were friends of the same sex and race of the chooser; 25 friends of the opposite sex were chosen, and only two friends of another race were chosen.

The dependent variable in the third hypothesis was the locus of control of the friends chosen by the subjects (F-LOC). Since each sociometric choice, not each subject, was the individual unit of analysis for this hypothesis, a subject's locus of control was used as many times as he was chosen as a friend. The mean F-LOC was 15.19 with a standard deviation of 6.08. Friends' locus of control ranged from 3 to 30.

As previously mentioned, the N-S test results of this study were factor analyzed in the hope of finding a social factor. However, the factor analysis indicated that there was no substantial factor structure.

The descriptive data have been presented above; the next three sections present the results of the hypothesis testing.

First hypothesis. The first hypothesis postulated a significant relationship between the subject's locus of control (LOC) and their sociometric status on the best friends item (SM_{bf}), such that internals would be more popular than externals. (As mentioned in the previous section, SMS was transformed to T-scores and labeled SM.) It was hypothesized that the relationship between LOC and SM_{bf} would be significant with sex and race partialled out. Also, interactions between locus of control and sex (LOC x sex) and locus of control and race (LOC x race) and a curvilinear locus of control term (LOC^2) were checked for significance. The results of the multiple regression equation used to predict SM_{bf} are presented in Table 4-2.

Table 4.2.--The magnitude and significance of variables used to predict sociometric status on the best friends item

Variable	Order in the equation	Beta	Zero-order correlation	Multiple R	With variables partialled out	
					Variables partialled out	F-ratio
Sex	1st	.170	-.012	.012	none	.028
Race	2nd	-.188	.033	.034	sex	.205
LOC	3rd	-.347	-.147	.167	sex, race	5.41*
LOC x sex	4th	-.215	-.094	.191	sex, race, LOC	1.73
LOC x race	5th	.277	.039	.214	sex, race, LOC	2.15
LOC ²	6th	.227	-.117	.218	sex, race, LOC	2.67

*p < .01.

The zero-order correlation between LOC and SM_{bf} was $-.147$ which is in the predicted direction and statistically significant ($p < .01$). Sex and race were not significantly related to SM_{bf} . The F-ratio of LOC, as a predictor of SM_{bf} , with sex and race partialled out was 5.41 ($df = 3, 196$) which is significant at the $.01$ level. However, LOC accounted for less than three percent of the variance in SM_{bf} . With sex, race, and LOC entered into the multiple regression equation, none of the other variables $[(LOC \times sex), (LOC \times race), (LOC^2)]$ was a significant predictor of SM_{bf} .

Second hypothesis. The second hypothesis predicted a significant relationship between locus of control (LOC) and sociometric status on the work-project item (SM_{wp}), when sex and race were partialled out. It was also predicted that the relationship between LOC and SM_{wp} would be greater than the relationship between LOC and SM_{bf} . As in the first hypothesis, $(LOC \times sex)$, $(LOC \times race)$, and LOC^2 were tested for significance. The results of the multiple regression are presented in Table 4-3.

The zero-order correlation between LOC and SM_{wp} was $-.302$ which is in the predicted direction and significant at the $.0001$ level. A formula recommended by Roscoe (1969) was used to determine the statistical significance, if any, of the difference between this correlation ($r = -.302$) and the correlation between LOC and SM_{bf} ($-.147$). These two correlations were not significantly

Table 4-3.--The magnitude and significance of variables used to predict sociometric status on the work-project team

Variable	Order in the equation	Beta	Zero-order correlation	Multiple R	With variables partialled out	
					Variables partialled out	F-ratio
Sex	1st	.363	.108	.108	none	2.33
Race	2nd	-.315	-.038	.113	sex	.224
LOC	3rd	-.284	-.302	.311	sex, race	18.23*
LOC x sex	4th	-.317	-.042	.330	sex, race, LOC	2.54
LOC x race	5th	.377	-.044	.346	sex, race, LOC	2.45
LOC ²	6th	.051	-.272	.346	sex, race, LOC	2.29

* $p < .01$.

different from each other at the .05 level, but the probability that they were not different was less than .10.

Sex and race were the first variables in the multiple regression equation, but neither produced a significant F-ratio. With sex and race partialled out, LOC produced a F-ratio of 18.23 ($df = 3, 196$) which was significant at the .01 level. LOC, with sex and race controlled for, accounted for about eight percent of the variance in SM_{wp} . With sex, race, and locus of control entered into the multiple regression equation, $(LOC \times sex)$, $(LOC \times race)$, and LOC^2 were not statistically significant.

Third hypothesis. The third hypothesis postulated a significant relationship between a subject's locus of control (LOC) and the locus of control of his friends (F-LOC), even when sex and race were accounted for. Interactions between sex and locus of control ($LOC \times sex$) and race and locus of control ($LOC \times race$) and a curvilinear locus of control term (LOC^2) were also checked for significance. The results of the multiple regression equation used to predict F-LOC are presented in Table 4-4.

The zero-order correlation between the subject's locus of control (LOC) and the locus of control of their friends (F-LOC) was .228 which was significant ($p < .00001$). With sex and race partialled out, LOC produced an F-ratio of 7.15 ($df = 3, 409$) which was a significant ($p < .01$) predictor of F-LOC, but it accounted for less than two percent of the variance in F-LOC.

able 4-4.--The magnitude and significance of variables used to predict friends' locus of control

Variable	Order in the equation	Beta	Zero-order correlation	Multiple R	With variables partialled out	
					Variables partialled out	F-ratio
Race	1st	.525	.306	.306	none	42.58**
Sex	2nd	-.544	-.191	.347	race	12.22**
L0C	3rd	.041	.228	.368	sex, race	7.15**
L0C x sex	4th	.425	-.050	.398	sex, race, L0C	11.08**
L0C ²	5th	-.042	.199	.400	sex, race, L0C	5.27*
L0C x race	6th	-.281	.287	.405	sex, race, L0C	4.32*

* $\underline{p} < .05$.

** $\underline{p} < .01$.

With sex, race, and LOC partialled out, both interactions (LOC x sex and LOC x race) added small, but statistically significant ($p < .01$, $p < .05$, respectively), contributions to the equation. An ex post facto analysis indicated that the interactions were such that LOC was significantly related to F-LOC for females ($r = .31$, $p < .000001$), but not for males ($r = .03$), and that LOC was significantly related to F-LOC for whites ($r = .20$, $p < .00011$), but not for blacks ($r = .06$).

With sex, race, and LOC partialled out, the curvilinear term (LOC^2) added a small, but statistically significant ($p < .05$), contribution to the equation. The chi square matrix illustrated in Table 4-5 suggests that the nature of the curvilinear relationship between LOC and F-LOC is such that the similarity hypothesis is valid for internals, but not for externals. Therefore, the multiple regression equation was run separately for internals and externals.

Table 4-5.--Chi square matrix indicating the locus of control of friends chosen by internals, moderates, and externals

		Friends' locus of control		
		Internals	Moderates	Externals
<u>Choosers</u>	Internals (<u>N</u> = 154)	83	27	44
	Moderates (<u>N</u> = 128)	47	40	41
	Externals (<u>N</u> = 131)	42	42	47

Chi square = 17.33, df = 4, $p < .002$.

Table 4-6 compares the ability of LOC to predict F-LOC in three samples--the total sample, internals, and externals. For externals, neither their sex nor their locus of control was significantly related to the locus of control of their friends. For internals, LOC was significantly related to F-LOC ($r = .40$, $p < .00001$); but, with sex and race partialled out while LOC was statistically significant ($p < .01$), it accounted for only 2.2 percent of the variance in F-LOC.

Table 4-6.--Simple correlation and unique contribution of LOC in predicting F-LOC for total sample, internals, and externals

Sample	Simple r (LOC/F-LOC)	Unique contribution of LOC with sex and race accounted for	F-ratio of unique contribution
Total ($N = 413$)	.23	.015	7.47**
Internals ($N = 154$)	.26	.022	3.89*
Externals ($N = 131$)	.05	.000	.032

* $p < .05$.

** $p < .01$.

Thus, locus of control was a statistically significant predictor of SM_{df} , SM_{wp} , and F-LOC. The theoretical and practical significance of these results are presented in the next section.

Discussion of the Results

The theoretical and educational significance of each hypothesis is discussed in the following section. Also, some recommendations for future research and theory development are discussed.

First hypothesis. Although the relationship between locus of control and sociometric status on the best friends item was statistically significant, even with sex and race controlled, the relationship was so slight that it lacked practical significance. In fact, for all practical purposes, this study indicated that internals and externals are about equal in social popularity; this supports Nowicki and Roundtree (1971) and Adinolfi (1970) who found no relationship between locus of control and sociometric status on purely social items.

This researcher expected that locus of control would be a more potent predictor of sociometric status. Its weakness as a predictor may be due to any one or a combination of the following explanations:

1. Externals may value friendship more than internals.

According to social learning theory (Rotter, 1954), behavior is a function of both an individual's expectancy about his behavior obtaining reinforcement and the value the individual places on the reinforcement in question. Therefore, a low expectancy could be balanced out by a highly valued reinforcement. For example, a starving person might strive desperately for food, even when he has a low expectancy of obtaining food.

2. There may be a specific sense of control related to social situations that is not highly correlated with generalized locus of control.

3. Locus of control may be related to goal-seeking behavior, but not to the more spontaneous behavior of making and maintaining friendships.

The first explanation (externals may value friendship more than internals) may have some merit. Therefore, future studies that investigate the relationship between locus of control and peer acceptance should include a measure of the need for affiliation.

The second explanation (there is a specific sense of control related to social situations) may have some merit. Even though studies that have factor analyzed locus of control scales have not yielded a purely social factor, it may be that the items of these scales do not tap such a dimension.

The third explanation (locus of control is related only to goal-seeking behavior) is closely related to the previous explanation. Locus of control has been more clearly related to goal-directed activities, like academic work and problem solving. These activities are usually step-by-step procedures that are aided by planning and directed at specific, known goals. These activities also rely heavily on cognitive ability. On the other hand, an adolescent's social world is not a step-by-step process. Specific goals are usually not formulated; and if they are formulated and adhered to in a rigid manner, the goal-seeker

is almost guaranteed social failure. Also, cognitive skill is less important in social situations than it is in school and similar activities. It seems that locus of control is most clearly associated with methodical, cognitive effort; and this type of effort may not be as helpful in formal social situations as it is in formal academic-like tasks.

The processes of adolescent friendship need further explanation. It would be helpful to know more about how and why adolescents associate with each other. It would also be helpful to understand how adolescents (and others) perceive their relationships with their friends. For example, do people believe they can control their friends? If they do, what do they mean by "control?" What effects, if any, do different notions of control have on social relationships? It seems as though present locus of control instrumentation is too restrictive for such an exploration. Psychologists should begin with in-depth interviews, field observation, and projective testing. Open-ended procedures may produce data that can be used to formulate a concept of man's perception of his interaction with his environment that is more sophisticated and more complex than Rotter's concept of locus of control.

Concerning the educational significance of this hypothesis, it appears that internality is not clearly associated with popularity or the lack of popularity. Therefore, educators (probably) need not be concerned with possible social disadvantages of internality, at least not on an individual basis. (Increasing internality may have

some disadvantages to the group; for example, is a team integrated with internals and externals more productive and harmonious than a team that is exclusively internal or external? In other words, this study produced no evidence suggesting a child may lose peer acceptance in becoming more internal. Therefore, educators can proceed with more confidence in advocating internality change programs.

In summary, future studies that investigate the relationship between locus of control and peer acceptance should use a measure of the need for friendship, since social learning theory predicts that the value of peer acceptance should interact with locus of control and peer acceptance. Also, as described above, a more complex, socially sensitive concept of sense of control should be used. Although there may be no social disadvantages associated with internality on an individual basis, the effects of locus of control on group harmony and productivity should be investigated.

Second hypothesis. Locus of control was an effective predictor of sociometric status on the academic project item. This finding suggests that the subjects chose peers who did well in school, and those students tended to be internal. This evidence adds support to the notion that internality is associated with academic success.

This finding is closely related to the results of the Nowicki and Roundtree (1971) study; in their study internals were not more popular than externals on the best friends item, but internal males were more

popular on a sociometric item that asked for nominations for class president. Thus, internals were given more consideration for tasks requiring intelligence and responsibility.

Future studies that relate locus of control to popularity on a task-oriented item should use aptitude in that task as a covariate.

Third hypothesis. Like the first hypothesis, this hypothesis was statistically significant but lacked practical significance due to the small size of the relationship between the dependent and independent variables. The data suggest that, given a biracial population of eighth grade boys and girls, there is a tendency for these students, especially the internals, to choose friends of a similar locus of control. However, most of this tendency is due to racial and sexual divisions within the classroom and racial and sexual differences in locus of control. In this sample the students chose, almost exclusively, friends of the same race and sex. Since black males, black females, white males, and white females all differed in locus of control, there was a substantial correlation between a subject's locus of control and his friends' locus of control on the basis of sex and race. When sex and race were partialled out, there was only a slight tendency for subjects to choose friends of a similar locus of control. This tendency was especially evident for three overlapping subgroups within the total sample--internals, females, and whites. The results of this hypothesis parallel the results obtained by Nowicki and Blumberg (1975)

and Phares and Wilson (1971) in that internals showed a preference for fellow internals and externals did not prefer other externals.

It appears that in real-life situations similarity in locus of control is not an overriding factor in interpersonal attraction. Perhaps a more sophisticated concept of control, one more applicable to social situations than Rotter's (1966), would be a more significant factor in interpersonal attraction. However, even a more sophisticated model of sense of control would be limited by the similarity hypothesis itself. This researcher does not recommend any further research on similarity in locus of control as a factor in interpersonal attraction, because Phares and Wilson (1971), Nowicki and Blumberg (1975), and this study all produced the same finding--internals have a slight tendency to prefer fellow internals, and externals do not prefer other externals.

There is a serendipitous finding of this study that deserves mention. Only two of the 200 subjects chose a classmate of another race as one of their "best friends"; a white girl and a black girl chose each other. Considering that this study was conducted in a school that has been desegregated, this finding suggests an important question. How is desegregation to help black children assimilate work-oriented attitudes, like an internal locus of control orientation, if blacks and whites remain socially separate? Of course, this question is based on the assumption that internality can be learned through modeling in informal, social situations; the investigation of this assumption would be an interesting study in itself.

In summary, the data indicated that (1) the internal subjects were slightly more popular, as friends, than the externals, (2) the internals were considerably more popular as working partners, and (3) the subjects, especially the internals, had a tendency to choose friends of a similar locus of control, but most of this tendency was due to racial and sexual preferences and racial and sexual differences in locus of control.

In this chapter the results have been presented and discussed. In the next chapter the study is summarized and the conclusions are stated.

CHAPTER V SUMMARY AND CONCLUSIONS

The final chapter consists of two sections. The first section is a summary of the purpose, rationale, methodology, and results of the study. The second section states the conclusions, including recommendations for future research.

Summary

This study investigated the relationship between adolescents' locus of control and their peer preferences. Locus of control was defined as the degree to which an individual expects that his reinforcement is contingent upon his behavior; individuals with an internal locus of control generally believe that they control what happens to them, whereas those with an external locus of control believe that their destiny is beyond their control and is determined by fate, luck, or powerful others.

There has been a great deal of research indicating that internality is associated with academic success and cognitive superiority, but there has been relatively little investigation of the social correlates of locus of control. This study related locus of control to popularity as a friend, popularity as a working partner, and

interpersonal attraction. More specifically, the following hypotheses were tested:

1. Internal adolescents are more popular (have more friends) than their external peers.
2. Internals are more popular as working partners on an academic project than they are as friends.
3. Adolescents tend to choose as friends those who are similar to themselves in locus of control.

To investigate these hypotheses, 200 eighth graders were administered the Nowicki-Strickland Locus of Control Scale for Children and two sociometric items. The first sociometric item was "Name the students who are your best friends"; and the second item was "If you had to work on a group project in English with three other students who would you select to work with?"

Multiple regression was used to analyze each hypothesis. For the first hypothesis the dependent variable was sociometric status on the best friends item (SMS_{bf}); that is, the number of times the subject was chosen as a best friend. The principal independent variable was the subject's locus of control (LOC); thus locus of control was used to predict popularity. Sex and race were controlled by forcing these two variables into the multiple regression equation before locus of control. Also, interactions between locus of control and sex (LOC x sex) and locus of control and race (LOC x race) and curvilinear locus

of control term (LOC^2) were checked for significance. Thus, the complete multiple regression equation was as follows:

$$\hat{SMS}_{bf} = \text{sex} + \text{race} + LOC + (LOC \times \text{sex}) + (LOC \times \text{race}) + LOC^2$$

The predictors for the other two hypotheses were the same as above; the dependent variable for the second hypothesis was sociometric status on the work-project item, and for the third hypothesis it was the subjects' friends' locus of control. Thus, the subjects' locus of control was used to predict their social popularity, popularity as a working partner, and their friends' locus of control.

In each of these multiple regression equations, with sex and race partialled out, locus of control was a statistically significant ($p < .01$) predictor of the dependent variable. However, locus of control, with sex and race partialled out, accounted for less than three percent of the variance in social popularity and less than two percent of the variance in friends' locus of control. Locus of control accounted for about eight percent of the variance in sociometric status on the work-project item. The following table summarizes the efficacy of locus of control in predicting sociometric status on the best friends item (SMS_{bf}), sociometric status on the academic work-project item (SMS_{wp}), friends' locus of control (F-LOC).

The conclusions of this study are stated in the next section.

Table 5-1.--Locus of control as a predictor of popularity as a friend and work partner and friends' locus of control

Dependent variable	Hypothesis	Zero-order correlation	With variables partialled out	
			Variance accounted for	F-ratio
SMS _{bp}	1st	-.147	2.7%	5.41*
SMS _{wp}	2nd	-.302	8.4%	18.23*
F-LOC	3rd	.228	1.5%	7.15*

* $p < .01$.

Conclusions

The results of this study indicate the following:

1. Internal adolescents are slightly more popular than externals as best friends.
2. Internals are more popular as partners on an academic project than they are as best friends.
3. In a biracial group of eighth grade boys and girls almost all students choose best friends of the same sex and race.
4. Using the Nowicki-Strickland Locus of Control Scale to measure the locus of control of eighth graders, white females are more internal than white males who are more internal than black females, and black males are the most external.

5. In a biracial population of eighth grade boys and girls there is a significant tendency for these adolescents to choose best friends of a similar locus of control, but most of this tendency is due to sexual and racial preferences and sexual and racial differences in locus of control.

6. The tendency to choose friends of a similar locus of control was most evident for whites, females, and internals.

Based on the results of this study, the following suggestions were recommended for future research in the social aspects of locus of control:

1. Covariates like sex, race, socioeconomic status, and IQ should be used in locus of control research. Perhaps some of the variables that have been related to locus of control were overestimated because of a third variable that was related to both locus of control and the variable being investigated.

2. Interactions between locus of control and variables like sex, race, socioeconomic status, and IQ should be examined. Perhaps some significant relationships with locus of control have been overlooked, because the investigator did not check for interactions.

3. When relating locus of control to peer acceptance, the need for approval should be considered in that social learning theory predicts that the need for approval should interact with locus of control and peer acceptance.

4. Also, curvilinear relationships between locus of control and relevant variables should be explored. Perhaps, as it was in this study, the variable has a different relationship to internal locus of control than to external locus of control.

5. There is a possibility that informal, social segregation within desegregated schools is preventing blacks from acquiring desirable middle class attitudes; this possibility needs to be investigated.

6. The effects of locus of control on group harmony and productivity should be investigated. For example, a study could compare the productivity and harmony of a group integrated with internals and externals to groups that were exclusively internal or external.

7. The possibility that locus of control has special significance for goal-directed behavior (like academic work), rather than spontaneous behavior (like making friends), deserves investigation and consideration in theory construction.

8. A theory more sophisticated than Rotter's concept of locus of control needs to be developed to explain man's perception of his interaction with his environment (especially his social environment). This theory development should begin with a series of open-ended exploratory studies.

These last two recommendations, especially the last one, suggest major changes in locus of control theory. Although it will be

difficult to abandon the standardized instruments, the linear model, and traditional psychological methodology; it will be necessary if locus of control is to help psychologists make insightful discoveries about the nature of man.

APPENDICES

APPENDIX A

APPENDIX A
THE NOWICKI-STRICKLAND LOCUS OF CONTROL SCALE FOR CHILDREN

INSTRUCTIONS: There are 40 questions to this survey. Please answer them by checking (✓) the YES or NO column for each question. There are no right or wrong answers--your honest opinion is what matters.

YES NO

- | | | |
|-----|-----|---|
| ___ | ___ | 1. Do you believe that most problems will solve themselves if you just don't fool with them? |
| ___ | ___ | 2. Do you believe that you can stop yourself from catching a cold? |
| ___ | ___ | 3. Are some kids just born lucky? |
| ___ | ___ | 4. Most of the time do you feel that getting good grades means a great deal to you? |
| ___ | ___ | 5. Are you often blamed for things that just aren't your fault? |
| ___ | ___ | 6. Do you believe that if somebody studies hard enough he or she can pass any subject? |
| ___ | ___ | 7. Do you feel that most of the time it doesn't pay to try hard because things never turn out right anyway? |
| ___ | ___ | 8. Do you feel that if things start out well in the morning that it's going to be a good day no matter what you do? |
| ___ | ___ | 9. Do you feel that most of the time parents listen to what their children have to say? |

YES NO

- ___ ___ 10. Do you believe that wishing can make good things happen?
- ___ ___ 11. When you get punished does it usually seem it's for no good reason at all?
- ___ ___ 12. Most of the time do you find it hard to change a friend's (mind) opinion?
- ___ ___ 13. Do you think that cheering more than luck helps a team to win?
- ___ ___ 14. Do you feel that it's nearly impossible to change your parent's mind about anything?
- ___ ___ 15. Do you believe that your parents should allow you to make most of your own decisions?
- ___ ___ 16. Do you feel that when you do something wrong there's very little you can do to make it right?
- ___ ___ 17. Do you believe that most kids are just born good at sports?
- ___ ___ 18. Are most of the other kids your age stronger than you are?
- ___ ___ 19. Do you feel that one of the best ways to handle most problems is just not think about them?
- ___ ___ 20. Do you feel that you have a lot of choice in deciding who your friends are?
- ___ ___ 21. If you find a four leaf clover, do you believe that it might bring you good luck?
- ___ ___ 22. Do you often feel that whether you do your homework has much to do with what kind of grades you get?
- ___ ___ 23. Do you feel that when a kid your age decides to hit you, there's little you can do to stop him or her?
- ___ ___ 24. Have you ever had a good luck charm?

YES NO

- ___ 25. Do you believe that whether or not people like you depends on how you act?
- ___ 26. Will your parents usually help you if you ask them to?
- ___ 27. Have you felt that when people were mean to you it was usually for no reason at all?
- ___ 28. Most of the time, do you feel that you can change what might happen tomorrow by what you do today?
- ___ 29. Do you believe that when bad things are going to happen they just are going to happen no matter what you try to do to stop them?
- ___ 30. Do you think that kids can get their own way if they just keep trying?
- ___ 31. Most of the time do you find it useless to try to get your own way at home?
- ___ 32. Do you feel that when good things happen they happen because of hard work?
- ___ 33. Do you feel that when somebody your age wants to be your enemy there's little you can do to change matters?
- ___ 34. Do you feel that it's easy to get friends to do what you want them to?
- ___ 35. Do you usually feel that you have little to say about what you get to eat at home?
- ___ 36. Do you feel that when someone doesn't like you there's little you can do about it?
- ___ 37. Do you usually feel that it's almost useless to try in school because most other children are just plain smarter than you are?
- ___ 38. Are you the kind of person who believes that planning ahead makes things turn out better?

YES NO

- ___ 39. Most of the time, do you feel that you have little
to say about what your family decides to do?
- ___ 40. Do you think it's better to be smart than to be
lucky?

APPENDIX B

APPENDIX B
THE SOCIOMETRIC QUESTIONNAIRE*

- A. Most classrooms have a few students who joke a lot and who make others in the room laugh. These are the "Class Clowns." Please list below the names (first and last) of the students you know who clown around a lot. Students should be in your grade.

1. _____
2. _____
3. _____

- ^{**}B. Name the students who are your best friends.

1. _____
2. _____
3. _____

- C. Name the students who usually come up with the best ideas for class projects or activities.

1. _____
2. _____
3. _____

- ^{**}D. If you had to work on a group project in English with three other students, and half of your grade depended upon this project, which three students would you select to work with?

1. _____
2. _____
3. _____

E. List the students that you think are liked by most everyone in the class.

1. _____
2. _____
3. _____

*Damico and Purkey, 1976.

**Questions used in this study.

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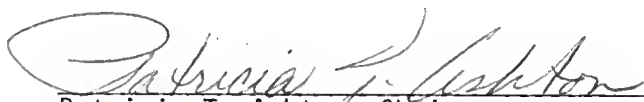
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BIOGRAPHICAL SKETCH


Mike Fagan is the son of Mathew and Rita. He was born in Youngstown, Ohio, on June 3, 1947. He received his Bachelor of Arts degree from Marquette University in 1969. After graduating from Marquette, Mike taught Junior High School in Cleveland, Ohio. Then he worked as a counselor for the Cleveland Job Corps; during this time he earned a Master of Arts degree in educational psychology from John Carroll University.

Since 1974 he has been a doctoral student in foundations of education at the University of Florida. Since moving to Gainesville, he has met and married Patricia Dunn Fagan. Mike has accepted a position at Kentucky Wesleyan College in Owensboro, Kentucky.

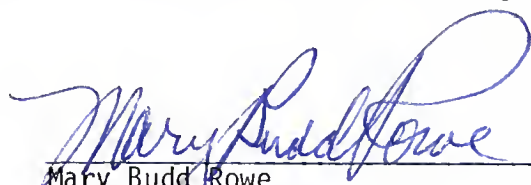
I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.


Patricia T. Ashton, Chairman
Professor of Foundations of Education


I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.


Walter A. Busby
Professor of Foundations of Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.


Mary Budd Rowe
Professor of Teacher Education
Subject Specialization

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.


Robert C. Ziller
Professor of Psychology

This dissertation was submitted to the Graduate Faculty of the College of Education and to the Graduate Council, and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

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